

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (currently amended) A method comprising:
 - 2 converting physical aspects of a common warehouse model (CWM) to corresponding
 - 3 database management system (DBMS) items in a relational database by processing in a
 - 4 hierarchical manner the physical aspects and creating the corresponding DBMS items, the
 - 5 physical aspects comprising relational catalogs, the relational catalogs comprising
 - 6 relational schemas, the corresponding DBMS items comprising DBMS catalogs, the
 - 7 DBMS catalogs comprising DBMS schemas[.], wherein converting comprises the
 - 8 operations of:
 - 9 (a) scanning through the relational catalogs;
 - 10 (b) for a first of the relational catalogs, creating a corresponding first DBMS catalog in
 - 11 the relational database;
 - 12 (c) for each of the relational schemas in the first relational catalog, creating a
 - 13 corresponding DBMS schema in the corresponding DBMS catalog to hold corresponding
 - 14 information; and
 - 15 (d) processing each of the relational schemas to produce corresponding information for
 - 16 the corresponding DBMS schema.

- 1 2. (canceled)

- 1 3. (currently amended) The method of Claim [2] 1 wherein, in operation (d), each of
- 2 the relational schemas is processed independently.

- 1 4. (original) The method of Claim 1 wherein operation (d) comprises:
- 2 (1) processing CWM data types included in a first of the relational schemas;
- 3 (2) creating DBMS data types corresponding to the CWM data types;
- 4 (3) processing relational tables included in the first relational schema;
- 5 (4) processing relational foreign key relationships for each of the relational tables;
- 6 (5) processing relational checkconstraints for the first relational schema;
- 7 (6) creating DBMS tables corresponding to the relational tables;
- 8 (7) processing relational views for the first relational schema;
- 9 (8) processing relational indices for the first relational schema;
- 10 (9) processing relational triggers for the first relational schema; and
- 11 (10) processing relational procedures for the first relational schema.

- 1 5. (original) The method of Claim 4 wherein (1) processing CWM data types included
- 2 in a first of the relational schemas comprises:
- 3 for one of the CWM data types, determining whether the CWM data type is user-defined;
- 4 if the CWM data type is user-defined, obtaining base type and constraint of the CWM data
- 5 type; and
- 6 if the CWM data type is text, obtaining a character set, name of language and collation sets
- 7 associated with the CWM data type.

- 1 6. (original) The method of Claim 5 wherein (2) creating DBMS data types
- 2 corresponding to the CWM data types comprises:
- 3 for a first of the CWM data types that is user-defined,
- 4 creating a corresponding DBMS data type in the corresponding DBMS schema;

- 5 setting physical type for the DBMS data type, based on the obtained base type of the first
6 CWM data type; and
- 7 binding a constraint to the DBMS data type, based on the obtained constraint of the first
8 CWM data type.

- 1 7. (original) The method of Claim 6 wherein (3) processing relational tables included
2 in the first relational schema comprises:
- 3 determining whether there is a first relational table in the first relational schema;
- 4 if there is a first relational table in the first relational schema, then:
- 5 determining relational columns in the first relational table, the first relational table
6 having a relational primary key; and, for each of the relational columns:
- 7 obtaining column properties including type, precision, scale, length,
8 IsNullable, CollationName, and CharactersetName;
- 9 verifying that the obtained type matches one of the DBMS data types;
- 10 determining whether the relational column is part of the relational primary
11 key; and
- 12 flagging the relational column if the relational column is part of the
13 relational primary key.

- 1 8. (original) The method of Claim 4 wherein (4) processing relational foreign key
2 relationships for each of the relational tables comprises:
- 3 for a first of the relational tables, enumerating child relational tables having foreign key
4 relationships with the first relational table;
- 5 for each of the foreign key relationships,

6 determining relational columns imported from the respective child relational table to
7 the first relational table; and

8 obtaining properties of each of the imported relational columns, including “update” and
9 “delete” referential integrity rules and deferability type.

1 9. (original) The method of Claim 4 wherein (5) processing relational
2 checkconstraints for the first relational schema comprises:

3 determining relational checkconstraints associated with the first relational schema;

4 obtaining parameters associated with a first of the relational checkconstraints; and

5 enumerating relational columns having references to the first relational checkconstraint.

1 10. (original) The method of Claim 4 wherein (6) creating DBMS tables corresponding
2 to the relational tables comprises:

3 selecting from the relational tables included in the first relational schema first tables
4 having no dependencies on any other of the relational tables; and

5 creating a corresponding DBMS table for each of the first selected tables.

1 11. (original) The method of Claim 10 further comprising:

2 selecting from the relational tables included in the first relational schema a second
3 table having dependency on at least one of the first selected tables; and

4 creating a corresponding DBMS table for the second selected table.

1 12. (original) The method of Claim 11 further comprising:

2 selecting from the relational tables included in the first relational schema a third
3 table having dependency on at least one of the second and the first selected tables; and

4 creating a corresponding DBMS table for the third selected table.

1 13. (original) The method of Claim 10 further comprising:

2 creating a corresponding DBMS table for each of mutually dependent tables from
3 the relational tables using forward references or ALTER TABLE commands.

1 14. (original) The method of Claim 10 wherein creating a corresponding DBMS table
2 comprises:

3 creating DBMS columns corresponding to columns of the corresponding relational
4 table;

5 setting properties including precision, scale, length, data type, IsNullable, .
6 CollationName, and CharactersetName for each of the DBMS columns based on respective
7 properties of the corresponding relational column;

8 if one of the DBMS columns is the only one of the DBMS columns that represents
9 a primary key or a foreign key, adding property of primary key or foreign key to the one
10 DBMS column; and

11 if there is a checkconstraint associated with one of the DBMS columns and not
12 involving any of the remaining DBMS columns, specifying the checkconstraint as column-
13 level constraint.

1 15. (original) The method of Claim 14 further comprising:

2 if there is a multi-column primary key or a multi-column foreign key in the
3 relational table, specifying the multi-column primary key or a multi-column foreign key in
4 the DBMS table at table-level and identifying the DBMS columns that represent the multi-
5 column primary key or a multi-column foreign key; and

6 if there is a checkconstraint involving multiple DBMS columns, specifying the
7 constraint in the DBMS table at table-level and identifying the involved DBMS columns.

1 16. (original) The method of Claim 14 further comprising:

2 specifying a foreign key in the DBMS table, including:

3 identifying a child DBMS table and DBMS columns being imported from the
4 child DBMS table; and

5 specifying properties of the foreign key, the properties including “update” and
6 “delete” referential integrity rules and deferability type.

1 17. (original) The method of Claim 4 wherein (7) processing relational views for the
2 first relational schema comprises:

3 determining relational views associated with the first relational schema;

4 for each of the relational views:

5 creating a corresponding DBMS view;

6 specifying updatability of the corresponding DBMS view; and

7 specifying query expression defining the corresponding DBMS view.

1 18. (original) The method of Claim 4 wherein (8) processing relational indices for the
2 first relational schema comprises:

3 determining relational indices associated with a first of the relational schemas;

4 for each of the relational indices:

5 creating a corresponding DBMS index to represent the relational index;

6 specifying DBMS columns used by the corresponding DBMS index; and

7 setting properties of the specified DBMS columns including IsNullable,
8 FilterCondition, and AutoUpdate.

1 19. (original) The method of Claim 4 wherein (9) processing relational triggers for the
2 first relational schema comprises:

3 determining relational triggers associated with the first relational schema;

4 for each of the relational triggers:

5 creating a corresponding DBMS trigger;

6 setting properties of the corresponding DBMS trigger based on properties of the
7 relational trigger, the relational trigger monitoring a relational table; and

8 setting a monitored DBMS table corresponding to the monitored relational table.

1 20. (original) The method of Claim 4 wherein (10) processing relational procedures for
2 the first relational schema comprises:

3 determining relational procedures associated with the first relational schema;

4 for each of the relational procedures:

5 creating a corresponding DBMS procedure; and

6 setting arguments for the corresponding DBMS procedure based on arguments of
7 the relational procedure.

1 21. (currently amended) An article of manufacture comprising:

2 a machine-accessible medium including data that, when accessed by a machine, cause the
3 machine to perform the operation of:

4 converting physical aspects of a common warehouse model (CWM) to corresponding
5 database management system (DBMS) items in a relational database by processing in a
6 hierarchical manner the physical aspects and creating the corresponding DBMS items, the
7 physical aspects comprising relational catalogs, the relational catalogs comprising
8 relational schemas, the corresponding DBMS items comprising DBMS catalogs, the
9 DBMS catalogs comprising DBMS schemas[.],wherein the operation of converting
10 comprises the operations of:

11 (a) scanning through the relational catalogs;

12 (b) for a first of the relational catalogs, creating a corresponding first DBMS catalog in
13 the relational database;

14 (c) for each of the relational schemas in the first relational catalog, creating a
15 corresponding DBMS schema in the corresponding DBMS catalog to hold corresponding
16 information; and

17 (d) processing each of the relational schemas to produce corresponding
18 information for the corresponding DBMS schema.

1 22. (canceled)

1 23. (currently amended) The article of manufacture of Claim [22] 21 wherein, in
2 operation (d), each of the relational schemas is processed independently.

1 24. (original) The article of manufacture of Claim 21 wherein operation (d) comprises:

2 (1) processing CWM data types included in a first of the relational schemas;

3 (2) creating DBMS data types corresponding to the CWM data types;

4 (3) processing relational tables included in the first relational schema;

5 (4) processing relational foreign key relationships for each of the relational tables;

6 (5) processing relational checkconstraints for the first relational schema;

- 7 (6) creating DBMS tables corresponding to the relational tables;
- 8 (7) processing relational views for the first relational schema;
- 9 (8) processing relational indices for the first relational schema;
- 10 (9) processing relational triggers for the first relational schema; and
- 11 (10) processing relational procedures for the first relational schema.

1 25. (original) The article of manufacture of Claim 24 wherein the operation of (1)
2 processing CWM data types included in a first of the relational schemas comprises:
3 for one of the CWM data types, determining whether the CWM data type is user-defined;
4 if the CWM data type is user-defined, obtaining base type and constraint of the CWM data
5 type; and
6 if the CWM data type is text, obtaining a character set, name of language and collation sets
7 associated with the CWM data type.

1 26. (original) The article of manufacture of Claim 25 wherein the operation of (2)
2 creating DBMS data types corresponding to the CWM data types comprises:
3 for a first of the CWM data types that is user-defined,
4 creating a corresponding DBMS data type in the corresponding DBMS schema;
5 setting physical type for the DBMS data type, based on the obtained base type of the first
6 CWM data type; and
7 binding a constraint to the DBMS data type, based on the obtained constraint of the first
8 CWM data type.

1 27. (original) The article of manufacture of Claim 26 wherein the operation of (3)
2 processing relational tables included in the first relational schema comprises:
3 determining whether there is a first relational table in the first relational schema;

4 if there is a first relational table in the first relational schema, then:

5 determining relational columns in the first relational table, the first relational table having a
6 relational primary key; and, for each of the relational columns:

7 obtaining column properties including type, precision, scale, length,
8 IsNullable, CollationName, and CharacterSetName;

9 verifying that the obtained type matches one of the DBMS data types;

10 determining whether the relational column is part of the relational primary
11 key; and

12 flagging the relational column if the relational column is part of the
13 relational primary key.

1 28. (original) The article of manufacture of Claim 24 wherein the operation of (4)
2 processing relational foreign key relationships for each of the relational tables comprises:
3 for a first of the relational tables, enumerating child relational tables having foreign key
4 relationships with the first relational table;

5 for each of the foreign key relationships,

6 determining relational columns imported from the respective child relational table to
7 the first relational table; and

8 obtaining properties of each of the imported relational columns, including "update" and
9 "delete" referential integrity rules and deferability type.

1 29. (original) The article of manufacture of Claim 24 wherein the operation of (5)
2 processing relational checkconstraints for the first relational schema comprises:
3 determining relational checkconstraints associated with the first relational schema;

- 4 obtaining parameters associated with a first of the relational checkconstraints; and
- 5 enumerating relational columns having references to the first relational checkconstraint.

1 30. (original) The article of manufacture of Claim 24 wherein the operation of (6)
2 creating DBMS tables corresponding to the relational tables comprises:
3 selecting from the relational tables included in the first relational schema first tables
4 having no dependencies on any other of the relational tables; and
5 creating a corresponding DBMS table for each of the first selected tables.

1 31. (original) The article of manufacture of Claim 30 wherein operation (6) further
2 comprises:
3 selecting from the relational tables included in the first relational schema a second
4 table having dependency on at least one of the first selected tables; and
5 creating a corresponding DBMS table for the second selected table.

1 32. (original) The article of manufacture of Claim 31 wherein operation (6) further
2 comprises:
3 selecting from the relational tables included in the first relational schema a third
4 table having dependency on at least one of the second and the first selected tables; and
5 creating a corresponding DBMS table for the third selected table.

1 33. (original) The article of manufacture of Claim 30 wherein operation (6) further
2 comprises:
3 creating a corresponding DBMS table for each of mutually dependent tables from
4 the relational tables using forward references or ALTER TABLE commands.

1 34. (original) The article of manufacture of Claim 30 wherein the operation of creating
2 a corresponding DBMS table comprises:

3 creating DBMS columns corresponding to columns of the corresponding relational
4 table;

5 setting properties including precision, scale, length, data type, IsNullable,
6 CollationName, and CharactersetName for each of the DBMS columns based on respective
7 properties of the corresponding relational column;

8 if one of the DBMS columns is the only one of the DBMS columns that represents
9 a primary key or a foreign key, adding property of primary key or foreign key to the one
10 DBMS column; and

11 if there is a checkconstraint associated with one of the DBMS columns and not
12 involving any of the remaining DBMS columns, specifying the checkconstraint as column-
13 level constraint.

1 35. (original) The article of manufacture of Claim 34 the operation of creating a
2 corresponding DBMS table further comprises:

3 if there is a multi-column primary key or a multi-column foreign key in the
4 relational table, specifying the multi-column primary key or a multi-column foreign key in
5 the DBMS table at table-level and identifying the DBMS columns that represent the multi-
6 column primary key or a multi-column foreign key; and

7 if there is a checkconstraint involving multiple DBMS columns, specifying the
8 constraint in the DBMS table at table-level and identifying the involved DBMS columns.

1 36. (original) The article of manufacture of Claim 34 the operation of creating a
2 corresponding DBMS table further comprises:

3 specifying a foreign key in the DBMS table, including:

4 identifying a child DBMS table and DBMS columns being imported from the
5 child DBMS table; and

6 specifying properties of the foreign key, the properties including “update” and
7 “delete” referential integrity rules and deferability type.

1 37. (original) The article of manufacture of Claim 24 wherein the operation of (7)
2 processing relational views for the first relational schema comprises:

3 determining relational views associated with the first relational schema;

4 for each of the relational views:

5 creating a corresponding DBMS view;

6 specifying updatability of the corresponding DBMS view; and

7 specifying query expression defining the corresponding DBMS view.

1 38. (original) The article of manufacture of Claim 24 wherein the operation of (8)
2 processing relational indices for the first relational schema comprises:

3 determining relational indices associated with a first of the relational schemas;

4 for each of the relational indices:

5 creating a corresponding DBMS index to represent the relational index;

6 specifying DBMS columns used by the corresponding DBMS index; and

7 setting properties of the specified DBMS columns including IsNullable,
8 FilterCondition, and AutoUpdate.

1 39. (original) The article of manufacture of Claim 24 wherein the operation of (9)
2 processing relational triggers for the first relational schema comprises:

3 determining relational triggers associated with the first relational schema;

4 for each of the relational triggers:

- 5 creating a corresponding DBMS trigger;
- 6 setting properties of the corresponding DBMS trigger based on properties of the relational
- 7 trigger, the relational trigger monitoring a relational table; and
- 8 setting a monitored DBMS table corresponding to the monitored relational table.

1 40. (original) The article of manufacture of Claim 24 wherein the operation of (10)

2 processing relational procedures for the first relational schema comprises:

- 3 determining relational procedures associated with the first relational schema;
- 4 for each of the relational procedures:

- 5 creating a corresponding DBMS procedure; and
- 6 setting arguments for the corresponding DBMS procedure based on arguments of the
- 7 relational procedure.

1 41. (currently amended) A system comprising:

- 2 a processor; and
- 3 a memory coupled to the processor, the memory containing program code that, when
- 4 executed by the processor, causes the processor to perform the operation of:

5 converting physical aspects of a common warehouse model (CWM) to corresponding

6 database management system (DBMS) items in a relational database by processing in a

7 hierarchical manner the physical aspects and creating the corresponding DBMS items, the

8 physical aspects comprising relational catalogs, the relational catalogs comprising

9 relational schemas, the corresponding DBMS items comprising DBMS catalogs, the

10 DBMS catalogs comprising DBMS schemas[.], wherein the operation of converting

11 comprises the operations of:

12 (a) scanning through the relational catalogs;

13 **(b) for a first of the relational catalogs, creating a corresponding first DBMS**
14 **catalog in the relational database;**

15 **(c) for each of the relational schemas in the first relational catalog, creating a**
16 **corresponding DBMS schema in the corresponding DBMS catalog to hold corresponding**
17 **information; and**

18 **(d) processing each of the relational schemas to produce corresponding**
19 **information for the corresponding DBMS schema.**

1 42. (canceled)

1 43. (currently amended) The system of Claim [42] 41 wherein, in operation (d), each of
2 the relational schemas is processed independently.

1 44. (original) The system of Claim 41 wherein operation (d) comprises:

- 2 (1) processing CWM data types included in a first of the relational schemas;
- 3 (2) creating DBMS data types corresponding to the CWM data types;
- 4 (3) processing relational tables included in the first relational schema;
- 5 (4) processing relational foreign key relationships for each of the relational tables;
- 6 (5) processing relational checkconstraints for the first relational schema;
- 7 (6) creating DBMS tables corresponding to the relational tables;
- 8 (7) processing relational views for the first relational schema;
- 9 (8) processing relational indices for the first relational schema;
- 10 (9) processing relational triggers for the first relational schema; and
- 11 (10) processing relational procedures for the first relational schema.

1 45. (original) The system of Claim 44 wherein the operation of (1) processing CWM
2 data types included in a first of the relational schemas comprises:
3 for one of the CWM data types, determining whether the CWM data type is user-defined;
4 if the CWM data type is user-defined, obtaining base type and constraint of the CWM data
5 type; and
6 if the CWM data type is text, obtaining a character set, name of language and collation sets
7 associated with the CWM data type.

1 46. (original) The system of Claim 45 wherein the operation of (2) creating DBMS data
2 types corresponding to the CWM data types comprises:
3 for a first of the CWM data types that is user-defined,
4 creating a corresponding DBMS data type in the corresponding DBMS schema;
5 setting physical type for the DBMS data type, based on the obtained base type of the first
6 CWM data type; and
7 binding a constraint to the DBMS data type, based on the obtained constraint of the first
8 CWM data type.

1 47. (original) The system of Claim 46 wherein the operation of (3) processing
2 relational tables included in the first relational schema comprises:
3 determining whether there is a first relational table in the first relational schema;
4 if there is a first relational table in the first relational schema, then:
5 determining relational columns in the first relational table, the first relational table having a
6 relational primary key; and, for each of the relational columns:
7 obtaining column properties including type, precision, scale, length,
8 IsNullable, CollationName, and CharactersetName;

9 verifying that the obtained type matches one of the DBMS data types;
10 determining whether the relational column is part of the relational primary
11 key; and
12 flagging the relational column if the relational column is part of the
13 relational primary key.

1 48. (original) The system of Claim 44 wherein the operation of (4) processing
2 relational foreign key relationships for each of the relational tables comprises:
3 for a first of the relational tables, enumerating child relational tables having foreign key
4 relationships with the first relational table;
5 for each of the foreign key relationships,
6 determining relational columns imported from the respective child relational table to
7 the first relational table; and
8 obtaining properties of each of the imported relational columns, including “update” and
9 “delete” referential integrity rules and deferability type.

1 49. (original) The system of Claim 44 wherein the operation of (5) processing
2 relational checkconstraints for the first relational schema comprises:
3 determining relational checkconstraints associated with the first relational schema;
4 obtaining parameters associated with a first of the relational checkconstraints; and
5 enumerating relational columns having references to the first relational checkconstraint.

1 50. (original) The system of Claim 49 wherein the operation of (6) creating DBMS
2 tables corresponding to the relational tables comprises:

3 selecting from the relational tables included in the first relational schema first tables
4 having no dependencies on any other of the relational tables; and
5 creating a corresponding DBMS table for each of the first selected tables.

1 51. (original) The system of Claim 49 wherein operation (6) further comprises:
2 selecting from the relational tables included in the first relational schema a second
3 table having dependency on at least one of the first selected tables; and
4 creating a corresponding DBMS table for the second selected table.

1 52. (original) The system of Claim 51 wherein operation (6) further comprises:
2 selecting from the relational tables included in the first relational schema a third
3 table having dependency on at least one of the second and the first selected tables; and
4 creating a corresponding DBMS table for the third selected table.

1 53. (original) The system of Claim 50 wherein operation (6) further comprises:
2 creating a corresponding DBMS table for each of mutually dependent tables from
3 the relational tables using forward references or ALTER TABLE commands.

1 54. (original) The system of Claim 50 wherein the operation of creating a
2 corresponding DBMS table comprises:
3 creating DBMS columns corresponding to columns of the corresponding relational
4 table;
5 setting properties including precision, scale, length, data type, IsNullable,
6 CollationName, and CharactersetName for each of the DBMS columns based on respective
7 properties of the corresponding relational column;

8 if one of the DBMS columns is the only one of the DBMS columns that represents
9 a primary key or a foreign key, adding property of primary key or foreign key to the one
10 DBMS column; and

11 if there is a checkconstraint associated with one of the DBMS columns and not
12 involving any of the remaining DBMS columns, specifying the checkconstraint as column-
13 level constraint.

1 55. (original) The system of Claim 54 wherein the operation of creating a
2 corresponding DBMS table further comprises:

3 if there is a multi-column primary key or a multi-column foreign key in the
4 relational table, specifying the multi-column primary key or a multi-column foreign key in
5 the DBMS table at table-level and identifying the DBMS columns that represent the multi-
6 column primary key or a multi-column foreign key; and

7 if there is a checkconstraint involving multiple DBMS columns, specifying the
8 constraint in the DBMS table at table-level and identifying the involved DBMS columns.

1 56. (original) The system of Claim 54 wherein the operation of creating a
2 corresponding DBMS table further comprises:

3 specifying a foreign key in the DBMS table, including:

4 identifying a child DBMS table and DBMS columns being imported from the
5 child DBMS table; and

6 specifying properties of the foreign key, the properties including “update” and
7 “delete” referential integrity rules and deferability type.

1 57. (original) The system of Claim 44 wherein the operation of (7) processing
2 relational views for the first relational schema comprises:

- 3 determining relational views associated with the first relational schema;
- 4 for each of the relational views:
 - 5 creating a corresponding DBMS view;
 - 6 specifying updatability of the corresponding DBMS view; and
 - 7 specifying query expression defining the corresponding DBMS view.

1 58. (original) The system of Claim 44 wherein the operation of (8) processing
2 relational indices for the first relational schema comprises:

- 3 determining relational indices associated with a first of the relational schemas;
- 4 for each of the relational indices:
 - 5 creating a corresponding DBMS index to represent the relational index;
 - 6 specifying DBMS columns used by the corresponding DBMS index; and
 - 7 setting properties of the specified DBMS columns including IsNullable,
 - 8 FilterCondition, and AutoUpdate.

1 59. (original) The system of Claim 44 wherein the operation of (9) processing
2 relational triggers for the first relational schema comprises:

- 3 determining relational triggers associated with the first relational schema;
- 4 for each of the relational triggers:
 - 5 creating a corresponding DBMS trigger;
 - 6 setting properties of the corresponding DBMS trigger based on properties of the
 - 7 relational trigger, the relational trigger monitoring a relational table; and
 - 8 setting a monitored DBMS table corresponding to the monitored relational table.

1 60. (original) The system of Claim 44 wherein the operation of (10) processing
2 relational procedures for the first relational schema comprises:

- 3 determining relational procedures associated with the first relational schema;
- 4 for each of the relational procedures:
 - 5 creating a corresponding DBMS procedure; and
 - 6 setting arguments for the corresponding DBMS procedure based on arguments of
 - 7 the relational procedure.

Amendments to the Drawings:

The attached sheet of drawing includes changes to Fig. 14.

Attachment: Replacement Sheet for Fig. 14